To: Deschambault, Lynda[Deschambault.Lynda@epa.gov]
Cc: Chris Stetler[chris.stetler@waterboards.ca.gov]; DCarey@waterboards.ca.gov[DCarey@waterboards.ca.gov]; Greg Reller[gr@burlesonconsulting.com]; Brown, Anthony R (RM)[anthony.brown@bp.com]; Cohen, Adam[Adam.Cohen@dgslaw.com]; Sandy Riese[sriese@ensci-inc.com]; Lambeth, Gregory[Gregory.Lambeth@amecfw.com]; Yuan, Peter[Peter.Yuan@amecfw.com]; Jefferson, Jill[Jill.Jefferson@amecfw.com]; Cory Koger[Cory.S.Koger@usace.army.mil]; Wirtschafter, Joshua[Wirtschafter.Joshua@epa.gov]; Hillenbrand, John[Hillenbrand.John@epa.gov]; Kay.Chang@usace.army.mil[Kay.Chang@usace.army.mil]; Marc Lombardi[marc.lombardi@amec.com]; Parrish, Kent[kent.parrish@amecfw.com]
From: Grant Ohland
Sent: Fri 5/26/2017 6:35:25 PM
Subject: RE: Leviathan Mine - Response to U.S. EPA Request for Information Regarding the Crusher Road Slope Instability

Lynda –

Marc is away from the office today so I am submitting the following response to your inquiry regarding the artesian flowing wells in the vicinity of the Crusher Road instability on behalf of Atlantic Richfield. As discussed in our meeting of May 23, 2017, all monitoring wells and piezometers at the Leviathan site are equipped with sealed well casing caps and locking protective covers in accordance with standard industry practices and our Standard Operating Procedures for well construction. Atlantic Richfield maintains the well caps and routinely inspects the well covers at the time of sampling or water level measurements to ensure a water tight seal on the wells. As you know, some of the wells and piezometers are equipped with pressure transducers that prevent a water tight seal due to presence of cables that extend outside the well casing.

Heavy snowmelt and related extremely wet ground conditions at the site are causing several wells in low-lying areas to exhibit flowing artesian conditions as you noted during your site visit. Flowing artesian conditions have been observed at the site in the past during wet conditions such as in the spring of 2011. To minimize the flow of groundwater out of the wells on to the ground surface, Atlantic Richfield requested that field crews monitor and maintain the sealed condition of well caps as described above. We are also in the process of temporarily extending the casings in those wells that are exhibiting flowing artesian conditions. This will allow measurement of groundwater heads above the top of the existing well casings and prevent groundwater from flowing onto the ground surface.

It is highly unlikely that tightening the caps on five 2-inch and 4-inch diameter wells could be having any effect on groundwater conditions and related pore pressures within the Crusher Road Slope. Shallow groundwater in the area of the flowing wells occurs in unconsolidated materials and bedrock adjacent to Leviathan Creek and the Channel

Underdrain. Extensive groundwater monitoring performed for the RI confirms that groundwater in this part of the site moves downgradient, is intercepted by the Channel Underdrain, and or/ discharges to Leviathan Creek. If groundwater was not flowing out of the monitoring wells, it would likely be emerging somewhere else. Whether or not the monitoring wells are present and whether they are closed or open to the atmosphere has little effect on the overall groundwater flow system. Assertions that capping the wells could be causing groundwater to back up within the groundwater flow system and thereby measurably increasing aquifer pore pressures within the Crusher Slope are simply not credible. If there is any hydrologic effect of capping at all, it would be limited to a localized area around the well bores. Notably, we have estimated that the head pressures at the flowing wells are less than 4 feet above the top of the well casings and would not be expected to extend any appreciable distance up the Crusher Road Slope. Further, allowing the wells to overflow would not be expected to have any noticeable effect on relieving pressures within the Slope.

Atlantic Richfield believes we should continue to adhere to Standard Operating Procedures and maintain sealed well casing caps on all wells or utilize temporary extensions on well casings to stop the flow from the wells. Allowing the wells to overflow onto the ground will only create muddy conditions around the wells and possibly cause erosion and sediment transport towards Leviathan Creek.

Please let us know if you have any questions or need additional information.

Regards,

Grant

From: Deschambault, Lynda [mailto:Deschambault.Lynda@epa.gov]
Sent: Monday, May 22, 2017 3:32 PM
To: Brown, Anthony R (RM) <anthony.brown@bp.com>; Lombardi, Marc <Marc.Lombardi@amecfw.com>
Cc: Greg Reller <gr@burlesonconsulting.com>; Cory Koger <Cory.S.Koger@usace.army.mil>; Hillenbrand, John <Hillenbrand.John@epa.gov>; Chang, Kay SPK <Kay.Chang@usace.army.mil>; Wirtschafter, Joshua <Wirtschafter.Joshua@epa.gov>; Hillenbrand, John <Hillenbrand.John@epa.gov>
Subject: RE: Leviathan Mine - Response to U.S. EPA Request for Information Regarding the Crusher Road Slope Instability

Tony/ Marc,

During our site visit last Friday, we noted that wells downgradient of the slump you are monitoring have recently been capped.

When asked, Waterboard staff noted that the wells were observed as being artesian during this extremely wet year. So It seems they were capped by Atlantic Richfield sometime in mid to late April.

EPA was not aware of the high artesian flow; or that the wells were being capped.

By the end of this week or May 26th, could you please provide an update, explanation and an assessment if this could affect the pore pressure in the area by the slump?

In addition, Please include a full assessment of this in your instability monitoring plan report.

Lynda

From: Lombardi, Marc [mailto:Marc.Lombardi@amecfw.com]
Sent: Monday, May 22, 2017 12:41 PM
To: DCarey@waterboards.ca.gov
Cc: Chris Stetler (chris.stetler@waterboards.ca.gov) <chris.stetler@waterboards.ca.gov>; Deschambault, Lynda <Deschambault.Lynda@epa.gov>; Greg Reller <gr@burlesonconsulting.com>; Brown, Anthony R (RM) <anthony.brown@bp.com>; Cohen, Adam (Adam.Cohen@dgslaw.com) <Adam.Cohen@dgslaw.com>; 'Sandy Riese' <sriese@ensci-inc.com>; Lambeth, Gregory <Gregory.Lambeth@amecfw.com>; Yuan, Peter <Peter.Yuan@amecfw.com>; Jefferson, Jill <Jill.Jefferson@amecfw.com>; Grant Ohland - (gohland@ohlandhydrogeo.com) <gohland@ohlandhydrogeo.com>
Subject: Leviathan Mine - Crusher Road Slope Instability Monitoring Plan

Doug,

Attached is Atlantic Richfield's Monitoring Plan for the Crusher Road Slope Instability. Please let us know if the LRWQCB has any issues with us implementing this plan. We would like to begin installation of the survey points and initial monitoring as described in the plan on this Wednesday (5/24).

Please let me know if you have any questions.

Thanks,

Marc

Marc R. Lombardi, CEM, PG

Principal Geologist / Office Manager, Environment & Infrastructure Americas, Amec Foster Wheeler

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From: Lombardi, Marc [mailto:Marc.Lombardi@amecfw.com]
Sent: Friday, May 12, 2017 5:38 PM
To: Deschambault, Lynda <Deschambault.Lynda@epa.gov>
Cc: Greg Reller <gr@burlesonconsulting.com>; Cory Koger <Cory.S.Koger@usace.army.mil>; Brown, Anthony R (RM) <anthony.brown@bp.com>; Cohen, Adam <Adam.Cohen@dgslaw.com>; 'Sandy Riese' <sriese@ensci-inc.com>; DCarey@waterboards.ca.gov; Chris Stetler (chris.stetler@waterboards.ca.gov) <chris.stetler@waterboards.ca.gov>; Jefferson, Jill <Jill.Jefferson@amecfw.com>; Grant Ohland - (gohland@ohlandhydrogeo.com) <gohland@ohlandhydrogeo.com>; Lambeth, Gregory <Gregory.Lambeth@amecfw.com>; Starr, Robert <Robert.Starr@amecfw.com>
Subject: Leviathan Mine - Response to U.S. EPA Request for Information Regarding the Crusher Road Slope Instability

Lynda,

On behalf of Atlantic Richfield, Amec Foster Wheeler is submitting the attached memorandum presenting an update of our observations relating to the instability of the Crusher Road slope. We are in the process of preparing a slope movement monitoring plan and will forward a copy to U.S. EPA when it is complete – anticipated to be early next week.

The Crusher Road slope continues to exhibit significant movement however at this time the slope instability is not materially affecting LAS HDS Plant operations. Atlantic Richfield commenced capture of the CUD and DS and operation of the HDS Treatment System yesterday (May 11, 2017), as described in Mike Johnson's email sent to U.S. EPA last night. Progress on construction of the Upper Ponds Conveyance System and RI activities in the area have experienced delays and we expect the work schedules for these activities will continue to be impacted as we work around the slope instability. HDS operations and the ICT demonstration test could be impacted if there is additional slope movement, damage to Pond 4, or other changed conditions.

Should you have any questions or comments please contact Tony Brown at (657) 529-4537 or anthony.brown@bp.com.

Thanks,

Marc

Marc R. Lombardi, CEM, PG

Principal Geologist / Office Manager, Environment & Infrastructure Americas, Amec Foster Wheeler

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